NS-219 - Productive and Technological Reconversion of Colombia's Panela Sector

Colombia

NAMA Seeking Support for Preparation

A Overview

A.1 Party	Colombia
A.2 Title of Mitigation Action	Productive and Technological Reconversion of Colombia's Panela Sector
A.3 Description of mitigation action	The NAMA seeks to implement strategies towards GHG and pollutant reduction across the sector, focusing on three main technology areas: crop processes, mills technological upgrading and use of sub-products. The expected outcome is to create a transformational effect on the environment while generating positive socio-economic benefits. The project objectives are: 1. Productive transformation of crop processes • Plant resettlement and soil renewal through production intensification, increasing vegetation cover, reducing soil instability and increasing uptake of CO2. • Efficient use of nitrogen fertilizers. • Planned crop burning prevention. • Establishment of native binders' fields. • Dendroenergy development based on native forests 2. Mills technological upgrading • Implement Thermal recirculation processes • Bagasse feeders' implementation to eliminate residence time and methane emissions • Replacing internal combustion engines with electric ones • Wastewater treatment implementation for crop irrigation systems 3. Use of sub-products Residual biomass from harvesting process as an energy source for mill stoves. Secondarily for animal feed, agricultural production (mushrooms) and/or animal production (pigs bed).

Background context:

The panela sector plays a significant role in the Colombian economy. Colombia is the second largest producer of panela in the world, and panela is the second largest agroindustry after coffee in Colombia. The sector provides employment to 350,000 families in 70,000 farms and 22,000 panela mills – making it the main source of job generation in rural areas in Colombia. However, there is significant opportunity to increase the competitiveness of the sector by reducing energy use whilst reducing its environmental impact.

The sector typically uses traditional non-environmentally friendly technologies and approaches across the supply chain, including the use of firewood and (when there is firewood shortage) used tyres to generate heat (creating CO2 and sulphur dioxide in the process resulting in adverse health effects) and very inefficient combustion processes, resulting in only a 30% efficient use of energy and calorific losses of between 60-70%. The panela sector is responsible for the increasing deforestation and catchment area sedimentation in Colombia. These inefficiencies are contributing to a loss of competitiveness in the sector and reduced socio-economic sustainability, which has reduced job opportunities and migration away from rural areas.

The Ministry of Agriculture and Rural Development (MADR), and the Ministry of Environment and Sustainable (MADS), together with Fedepanela (National Federation of Panela producers), want to reverse this situation, therefore, the Panela's NAMA has been prioritised to be included in the National NAMA's portafolio.

The expected outcome of the proposed work is to produce a NAMA in the panela sector to create a transformational effect on the environment while generating positive economic benefits to the panela farmers. Therefore, the support to be provided will be a catalyser to the untapped economic, environmental and social benefits of a low carbon economy in the panela sector.

The output will be the catalyser to reduce more than 41,680 MtCO2e from the panela sector whilst improving the business competitiveness of thousands of farmers who are most vulnerable to climate changes. A further outcome of the project will be the contribution to build a more resilient economy that can sustain a reduction in the rate of deforestation with a positive net benefit of reduced flood risk to communities that are vulnerable.

The benefits of improving clean energy technologies and better energy management practices in the panela sector have the

potential to increase the efficiency of energy or burners by more than 8% which translates in annual reductions of 38 tCO2e by burner. This saving is attributed to decreasing or eliminating the consumption of wood and diesel, thanks to a superior energy efficiency performance and clean energy technologies.

This project will net a positive environmental contribution to meeting the Colombian commitments of reducing its GHG by 20% to 2030. Notably the project will also help Colombia reach its goals to reduce poverty, create new jobs, and increase the competitiveness of the industry.

Fedepanela and ECDBC have been working together on the design of the panela NAMA over the last year.

Social, environmental and economic cobenefits of the NAMA:

The proposed NAMA will give continuity to the efforts done during the last 8 years of Fedepanela who has been working towards increasing the profitability and reducing the environmental impact of the panela sector.

The desired outcome of the NAMA is expected to bring social, environmental and private sector benefits. More than 300,000 rural households will be benefit from the proposed NAMA. These benefits have been identified but are yet to be quantified in order to comply with the requirements of the NAMA.

The panela sector has significant socioeconomic implications because the majority of production is sourced from small agricultural holdings. These smallholdings are involved in both the plantation of the crops and processing of the panela. Modern crop procedures and industrial processes can increase the profitability of their business by improving the extraction efficiency of the cane in the mills and by generating energy savings from more efficient engines.

It is estimated around 70% of all car tyres used in Bogota are burnt in boilers for the production of panela. This practice has significant negative environmental impacts as the tyres release significant GHG when they are used as a fuel. Poor energy management practices such as using wood with high levels of humidity and wood from non-sustainable forests are common practices in the industrial process of panela.

It is common practice for the householders that occupy the farms to live in close proximity to the mills and boilers and therefore using tyres as a fuel source has potential significant implications on the health of those families.

Fedepanela has carried out several studies and summarised the main social, environmental and development benefits as follows:

- Costs production reduction by 8 % for non-use of additional fuel in the process of panela, e.g. without firewood, tyres or the burners.
- Increased energy efficiency burners in at least 15%.
- Decreased 0.8 kg. of bagasse per kg. of panela produced.
- Reduction of operating times (reduction of working hours by 15%).
- Environmental benefits by reducing the temperature of exhaust gases from the fireplace by operating at less than 500 ° C.
- 60% reduction of CO2e emissions per kg of panela produced.
- Significant decrease of deforestation in areas near to the panela area.
- 100% decrease in the consumption fuels such as wood or wheels, which not only increases the cost of manufacture of panela, but has a very negative impact in terms of GHG. This as a result of using a better quality of bagasse and combustion process.
- Increased profitability per unit of time as it increases the ability to do more grindings per month by using the bagasse as soon as it leaves the mills without waiting 30 days to be dried. This creates space reduction by almost 30% and labor reduction by 20% in the bagasse compared to business as usual (BAU).
- Better hygienic conditions of the farm due to the reduction of the bagasse.
- Deforestation reduction (and with it the deterioration of soils and water sources) associated with firewood consumption.
- Farmers' competitiveness increased as a result of the points mentioned above.

Project key barriers:

The key barrier to a NAMA focused on the panela sector is a lack of comprehensive information on the costs and benefits of delivering a large-scale and high-impact programme and to have an actionable large-scale programme design. To develop the NAMA we need to perform an in depth identification of activities and analyse the dependency between them as well as the time duration per activity to eliminate the risk of an inaccurate budget, which can jeopardize the impact of the NAMA. Another gap is the lack of tailor-made mechanisms including financial, technology transfer, and knowledge transfer—to deliver the NAMA programme.

One key barrier to design of the NAMA is coordinating and getting the buy-in of key stakeholders –local authorities, private sector, and local institutions—involved in the designed and implementation of the programme.

Other key gaps to have a panela NAMA include the identification of best practices in sowing of sugar cane to increase the productivity and reduce the environmental impact. Several

	studies have been done, but it is required to identify and select the actionable opportunities. All the previous gaps and barriers are solvable but there is a shortfall of resources to fill the gaps and eliminate the barriers.
A.4 Sector	☐ Energy supply ☐ Residential and Commercial buildings ☒ Agriculture ☐ Waste management ☐ Transport and its Infrastructure ☐ Industry ☐ Forestry ☐ Other
A.5 Technology	☐ Bioenergy ☒ Energy Efficiency ☐ Hydropower ☐ Wind Energy ☒ Carbon Capture and Storage ☐ Land fill gas collection ☐ Cleaner fuels ☐ Geothermal Energy ☐ Solar Energy ☐ Ocean Energy ☐ Low till / No till ☐ Other
A.6 Type of action	☒ National/ Sectoral goal ☒ Strategy ☐ National/Sectoral policy or program ☐ Project: Investment in machinery ☐ Project: Investment in infrastructure ☐ Project : other ☐ Other
A.7 Greenhouse gases covered by the action	☒ CO2 ☒ N2O ☐ PFCs ☒ CH4 ☐ HFCs ☐ SF6 ☐ Other

B National Implementing Entity

B.1.0 Name	Federación Nacional de Productores de Panela FEDEPANELA (National Association of Panela Producers)
B.1.1 Contact Person 1	Carlos Fernando Mayorga Morales
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B.1.4 Email	gerencia@fedepanela.org.co
B.1.5 Contact Person 2	Cecilia Medina Prieto
B.1.6 Address	Cra. 45 A No. 93-55, Bogotá D.C., Colombia
B.1.7 Phone	(57 1) 622 2066 – 622 2655
B.1.8 Email	bcmedina@fedepanela.org.co
B.1.9 Contact Person 3	
B.1.10 Address	
B.1.11 Phone	
B.1.12 Email	
B.1.13 Comments	The National Implementing Entity is FEDEPANELA, which is a non-for profit entity that embodies the Colombian panela producers. The mission of Fedepanela is to improve the quality of life of panela producers, increase the

competitiveness and profitability of the sub-sector, support the development of commercial, social and environmental initiatives, and the deployment of technologies.

Fedepanela is committed to research and development (R&D) initiatives that promote the development of technologies, generates economic benefits, and reduce the environmental impact. Energy and environment are key priorities in Fedepanela's strategy plan to influence policy and regulations in the panela sub-sector. Fedepanela is a key stakeholder in the implementation of the NAMA as they truly understand the local needs and opportunities in the panela sub-sector, and have the local network to help deliver the programme. This project will be done with the support of Fedepanela, and the financial sources will be channel through local financial institutions or other mechanisms that will be identified during the design of the NAMA.

The project is also being supported by the Ministry of Agriculture and Rural Development as National public entity, and endorsed by the Colombian Low Carbon Development Strategy, the mitigation programme from the Ministry of Environment and Sustainable Development of Colombia

C Expected timeframe for the preparation of the mitigation action

C.1	Number of months for completion	12

D Currency

D.1	Used Currency	AED Conversion to USD: 1

E Cost

E.1.1 Estimated full cost of preparation	200000
E.1.2 Comments on full cost of preparation	The NAMA's information Note has been finished finding that previous studies, investigations and pilot projects have been a good based for the decisión making process of the NAMA activities. Therefore, the estimate cost for finishing the NAMA design is $USD200,000 and includes the development of studies to implement GHG from crop processes, full GHG base line and projected emissions scenarios, the MRV plan and the design of detailed activities for each región prioritised by the project. To achieve the NAMA improvements, an investment of $USD 167 million will be needed for Implementation, this equates to $USD 8,000 per mill which comes to an abatement cost of 4 $USD/ tCO_2e, not accounting for the potential energy savings. The potential energy savings for mills that use diesel are significant, whilst mills that use tyres or wood as their primary energy source have less potential financial benefits from the improvements.

	In Colombia there are currently 21,000 mills in operation. The strategic plan of Fedepanela envisages to take advantage of economies of scale and reduce the number of mills to 8,000. As the total number of mills in operation significantly decreases with the strategic plan the cost of CO2 mitigation described above is a conservative estimate. Furthermore, the abatement cost is expected to decrease once the GHG emissions reductions of crop practices and sub-products are taken into account, but as of the present day there is incomplete knowledge on this topic.

F Support required to prepare the mitigation action

F.1.1 Amount of Financial support	200000
F.1.2 Type of required Financial support	[X] Grant [ ] Loan (sovereign) [ ] Loan (Private) [ ] Concessional loan [ ] Guarantee [ ] Equity [ ] Carbon finance [ ] Other
F.1.3 Comments on Financial support	The financial support could also be provided in kind as the need is to construct a complete GHG baseline and projected scenarios, the MRV process and the financial component of the NAMA. There is also need to strengthen investigations in order to reduce GHG in crop processes and to scale the NAMA activities among all geographic zones where the panela is produced in Colombia. For further information, please see chapter 4.6 in the attached document.
F.2.1 Amount of Technical support	
F.2.2 Comments on Technical support	Included in the financial support Budget.
F.3.1 Amount of capacity building support	
F.3.2 Type of required capacity building support	[X] Individual level [X] Institutional level [ ] Systemic level [ ] Other
F.3.3 Comments on Capacity Building support	Included in the financial support budget
F.4 Financial support required	[ ]
F.5 Technological support required	[ ]
F.6 Capacity support required	[ ]

G Relevant National Policies strategies, plans and programmes and/or other mitigation action

G.1 Relevant National Policies	The proposed activities have the following links with the ongoing initiatives in Colombia as shown by the examples below: • Climate Change Adaptation Fund (2010), aimed to accelerating the recovery process of the country after the rainy season and reduce the vulnerability of the population in particular flooding.

- Resolution 180919 of 2010, by which the indicative action plan is adopted 2010 - 2015 to develop the Program of Rational and Efficient Use of Energy and Other Forms of Non-Conventional Energy, PROURE.
- CONPES 3700 of 2011 "Institutional Strategy for the articulation of policies and actions on climate change in Colombia," where the need to work in four complementary strategies established to address the issue of climate change in the country: a. The Colombian Strategy for Low Carbon Development - ECDBC, b. The National Strategy for Reducing Emissions by avoiding Deforestation and Degradation - ENREDD + c. The National Plan for Adaptation to Climate Change - PNACC, and d. Financial Strategy Disaster Protection - EPFD.
- Structuring of the National System for Climate Change (DNP, 2011).
- Ministry of Environment. (2012) National Policy to manage the biodiversity and the ecosystem Services.
- The National REDD + Strategy (2012) is another national initiative that focuses on creating local, regional and national capacities for the implementation of mitigation projects through avoided deforestation and sustainable management of natural forests.
- The National Plan for Climate Change Adaptation (NAPCC, 2012) is a strategy to reduce the country's vulnerability and increase their capacity to respond to threats and projected impacts of climate change
- Low Carbon Strategy Development. 2012. (MADS, 2014)

In February 2012, the Ministry of Environment, set the Colombian low carbon strategy. To achieve a low-carbon development, the ECDBC has identified and assessed the actions required, developed Sector Action Plans in each country's productive sectors, creating tools for implementation, including a system of monitoring, reporting and verification. Therefore, the ECDBC is prioritizing those mitigation targets through the development of NAMAs. This sectorial approach has identified that the agricultural sector plays an important role in mitigating GHG with 38% of the total emissions of the country. If the emissions by land-use change and forestry (14%) is added the participation increases to 52%.

- Transversely to these components, the ECDBC has worked on a fourth component of mitigation issues in the productive sectors and a fifth that is the establishment of a national and international knowledge and communication platform.

- Rural Mission which promotes sustainable and competitive agricultural development in the field.
- Green Growth Strategy proposal on the basis of the National Development Plan 2014-2018

Particularly the new development Green Growth Strategy plan aims to promote sustainable development of the country ensuring "economic and social welfare in the long term and ensuring the recovery of the environment from the impacts of productive activities". According to the OECD the implications of the intensive over exploitation of natural resources in Colombia are potentially more damaging compared to its counterparts because of the high extractive industries and to the high urbanization rate to achieve economic development (OECD/ECLAC, 2014) Similarly by achieving green growth the sectors competitiveness is equally increased, ensuring natural resources recognized in this document as the basis of capital, thus preventing degradation of these and the impacts generated by climate change and extreme weather events continue to affect the most vulnerable and needy communities in the country (DNP , 2014) . The main objective set from above is to move towards a sustainable and low carbon development by promoting changes in sector's paths towards a more efficient and low-carbon strategies, seeking the productive transformation of the country through the implementation of instruments, encourage the productive use of land, especially agricultural, livestock and forestry, and identifying the ecological conditions of soil and environmental supply planning. (DNP, 2014). Additionally, the Inter-Ministerial Agenda established action lines that integrate mitigation measures such as: (1) conservation and sustainable use of environmental goods and services such as climate regulation and water supply, which aims for an integrated management on forest resources, strategic ecosystems and agro biodiversity management services of climate change mitigation and support to CDM projects and (2) environmental sustainability of domestic production, which seeks development on alternative management systems and promotes sustainable agricultural production, management environment for agricultural production and encourage efficient use of land and irrigation.

G.2 Link to other NAMAs

H Attachments

H Attachments

Title	Description
NINO PANELA VFINAL.pdf	

H.1 Attachment description: It is attached the NAMA's Information Note with the technical support of the project, along with the endorsement letters from FEDEPANELA and the Ministry of Agriculture of Colombia. The document is in Spanish, and soon will be upload the English version.

H.2 File: Browse...

I Support received

I.1 Outside the Registry

I.2 Within the Registry

Support provided	SupportType	Amount	Comment	Date